

CONTAINER HAVING SEPARATE STORAGE CHAMBERS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to containers, and more particularly, to a container having separate storage chambers capable of keeping different ingredients separate before use.

2. Description of Related Art

Conventionally, when preparing formulas for daily use or consuming a beverage that requires mixing up formulas with additives, liquid solution, gas, or other ingredients, it is often necessary to separately tear open the packages containing additives or formulas that need to be mixed, such as Antabuse, fresh vitamin C powder, carbon dioxide., etc, and then add the formulas to the liquid solution, such as water, beauty lotion, oxygen, or other ingredients that need to be mixed before the mixture can be readily used or consumed. This procedure is rather troublesome and time-consuming.

In order to address the above-mentioned drawbacks, the TW Utility Publication No. 231632 discloses a container having separate storage chambers, wherein a lid member can seal the opening of a drinking bottle. Referring to FIG. 1, the container comprises a main body 1 containing a first substance 12 and a lid member 2, engaged with the main body 1. The lid member 2 comprises a sealing ring 22, a storage vial 3 extending through the sealing ring 22, a protective cap 5 enclosing the storage vial 3 to protect the storage vial 3 from being pressed, and a disposable sealing member 52 covering the lid member 2. The storage vial 3 having a storage chamber S for storage of a second substance 6 includes a vial body 31, a push bar (not labeled) sealing a top end thereof, and an opened end opposite to the push bar. The opened end of the storage vial 3 is sealed up by a sealing film 4 that is attached to the sealing ring 22. In use, the disposable sealing member 52 is first torn off, then the push bar is depressed to cut open the sealing film such that the second substance 6 falls into the first substance 12, and is mixed with the first substance 12. However, the lid member 2 is usually formed without a guide mechanism

or a positioning mechanism for the storage vial 3, which easily result in the storage vial 3 overly rotating relative to the sealing ring 22, such that portions of the sealing film 4 are prone to be cut off and fall into the first substance 12, resulting in contamination of the first substance 12. Though the lid member 2 of the prior art improves on the drawbacks of the conventional mixing process and reduces packaging, it cannot ensure that the first substance 12 is free of contamination since the sealing film may be cut away and fall into the container.

In addition, the disposable sealing member 52 formed on the top of the protective cap 5 of the lid member 2 is not sealed airtight, which can only be achieved by means of precisely tight contact between the storage vial 3 and the sealing ring 2, which would necessitate increased manufacturing precision and thus increase the manufacturing costs. Furthermore, the tight contact between the storage vial 3 and the sealing ring 2 would likely make it difficult to depress the push bar for releasing the second substance 6.

To solve the above problems, an improved beverage container having separate storage chambers for receiving ingredients has been proposed. The beverage container comprises at least a main body (not labeled) and a lid member 9. Referring to FIG. 2, the lid member 9 comprises a sealing structure 111, two pieces of sealing film 113, and a push vial 117. The sealing structure 111, and the sealing films 113 jointly form a storage chamber S' for receiving ingredients 110 therein. In the case of a beverage container, the ingredients 110 are released from the storage chamber S' and are mixed up with the liquid solution contained in the beverage container by depressing the push vial 117 and cutting open both the sealing films 113. This necessitates a considerable amount of chamber for configuration of the push vial 117 and the storage chamber S' for receiving ingredients 110. As a result, the lid member 9 is not suitable for containers that are commonly used nowadays. In addition, such a lid member 9 is manufactured by a complicated molding process, resulting in unduly high manufacturing costs. Employing two pieces of sealing film 113 to store the ingredients 110 is also troublesome and inconvenient to implement. Thus, the problem of unduly high manufacturing and assembly costs is exacerbated.

FIG. 3 depicts another conventional container that is capable of separately storing a first substance 7 such as a liquid solution, and a second substance 8 such as ingredients. The first substance 7 can be mixed up with the second substance 8 by depressing and pulling a cap 9. An outlet 10a is defined in an opening 9a of the cap 9 for accessing the mixed first and second substances 7 and 8. In assembly of the container, the cap 9 is first attached to an upper body 11a. First and second engagement bodies 111a, 111b, and a cutting member 10 are assembled to the upper body 11a in order. The assembled upper body 11a is then secured to the lower body 11b to constitute the container, which is assembled by a number of individual parts. However, such a container cannot easily provide an airtight sealing effect due to its inherent complexity. Also, the process of assembling the container is unduly complicated and time-consuming. This design is also not suitable for application to existing containers. Furthermore, in view of the complicated assembly process, once the contents stored in the container are used up, it is troublesome to refill the container for repeated use.

SUMMARY OF THE INVENTION

In view of the above, an objective of the present invention is to provide a container having separate storage chambers, which has a simple structure and is easy to manufacture.

Another objective of the present invention is to provide a container having separate storage chambers which are reusable, and in which it is convenient for the user to access the mixed contents contained in the container.

Another objective of the present invention is to provide a container having separate storage chambers which is applicable to existing containers.

Another objective of the present invention is to provide a container having separate storage chambers which can provide a satisfactory airtight seal to preserve the contained substances from deterioration.

In order to achieve the above objectives, a container having separate storage chambers in accordance with the present invention comprises a main body containing a first substance, a lid member, an airtight member, a holder assembly, and an opener.

The main body has a storage chamber for accommodating a first substance, and an opening for accessing the storage chamber. The lid member is closely engaged with the main body. The lid member includes a cap, a circular peripheral ring adjacent to the cap, and a leakproof member disposed on an interior of the cap between the cap and the circular peripheral ring. The airtight member is for the tight encapsulation of a second substance to be mixed with the first substance.

The holder assembly is disposed within the opening of the main body. The holder assembly includes an outer part and an inner part. The outer part has an outer axial hole and a shoulder adapted for allowing the outer part to rest on the main body while providing tight contact between the shoulder and the leakproof member, so as to avoid spillage or leakage of the first substance. The inner part has an inner axial hole. The inner part is coaxially engaged in the outer axial hole of the outer part. Edges of the airtight enclosure are securely sandwiched between the inner and outer parts. The inner and outer parts respectively comprise positioning portions for ensuring a fixed interrelationship thereof and providing a reinforcement to hold the airtight enclosure.

The opener is coaxially disposed in the inner part. The opener includes a pressing portion around a top thereof, an active cutting portion around a bottom thereof for cutting open the airtight member, an inactive dull portion adjacent to the active cutting portion for preventing the airtight member from being completely cut off, and a through hole defined therein. The through hole is in communication with the inner axial hole, the opening, and the storage chamber. When the pressing portion is depressed to a point where the pressing portion is in contact with a top of the inner part, the airtight member is cut open by the cutting portion, thereby releasing the encapsulation of the second substance and allowing mixture of the first and second substances, with the opened-up airtight member remaining attached to the holder.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objectives, advantages and novel features of the invention will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings, in which:

FIG. 1 (PRIOR ART) is a cross-sectional view of a conventional container having separate storage chambers;

FIG. 2 (PRIOR ART) is a cross-sectional view of another conventional container;

FIG. 3 (PRIOR ART) is a partial section view of another conventional container;

FIG. 4 is an exploded and partially sectioned view of a container having separate storage chambers in accordance with a first embodiment of the present invention;

FIG. 5 is a partially sectioned, assembled view of the container of FIG. 4, and an enlarged view of a portion circled in FIG. 5;

FIG. 6 is a schematic partially sectioned view of the container of FIG. 4, with the cutting member fully depressed down;

FIG. 7 is an exploded and partially sectioned view of a container having separate storage chambers in accordance with a second embodiment of the present invention;

FIG. 8 is a top view of an outer part of FIG. 7;

FIG. 9 is an isometric view of an inner part of FIG. 7;

FIG. 10 is a partially sectioned, assembled view of the container of FIG. 7, and an enlarged view of a portion circled in FIG. 10; and

FIG. 11 is a schematic partially sectioned view of the container of FIG. 7, with the cutting member fully depressed down.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made to the drawings to describe the present invention in detail.

Referring to FIGS. 4-6, and particularly to FIG. 5, a container having separate storage chambers in accordance with a first embodiment of the present invention comprises a main body 20 for containing a first substance 30 therein, a lid member 40 tightly engaged with the main body 20, an airtight member 60 for encapsulation of a second substance 80, a holder assembly 50 for retaining the airtight member 60 therein, and an opener 70 adapted for releasing the encapsulation of the second substance 80.

Referring to FIG. 4, the main body 20 comprises a containing portion 20a defining a storage chamber S for receiving the first substance 30, a neck portion 20b adjacent to an upper part of the containing portion 20a, and an opening 20c in communication with the storage chamber S. A first thread 20d is defined in an outer surface of the neck portion 20b. The first substance can be in a gaseous state, a solid state, a liquid state, or any combination thereof.

The lid member 40 comprises a cap 40a, a circular periphery 40b adjacent to the cap 40a, a second thread 40c, and a circular leakproof member 40d disposed in an interior of the cap 40a. The leakproof member 40d can be integrally formed in an inner surface of the cap 40a, for enhancing airtight contact between the cap 40a and the opening 20c. The second thread 40c is defined in an inner surface of the lid member 40, for threaded engagement with the first thread 20d of the main body 20.

Referring also to FIG. 5, the holder assembly 50 comprises an outer part 51 and an inner part 53. The inner part 53 is detachably and coaxially disposed in the outer part 51. The assembled inner and outer parts 53, 51 are received in the opening 20c of the main body 20. The outer part 51 comprises a first engaging portion 51a, a shoulder 51b, an outer axial hole 51d, and two first positioning portions 51e (Fig. 4). The first engaging portion 51a is formed in an outer surface of the outer part 51, and is shaped and spaced apart with the point protrusions for allowing the outer part 51 to fixedly engage with the neck portion 20b. Alternatively, the outer part 51 may be engaged in the opening 20c when the present invention applies to a main body that does not have a neck portion. Alternatively, the first engaging portion 51a may be contiguous or spaced-apart flanges, protrusion blocks, or any other suitable configurations. The number of protrusions and structure of the first engaging portion 51a are exemplified for illustration purposes only, and are not intended to limit the present invention.

The shoulder 51b formed on a top of the outer part 51 extends outwardly such that the holder assembly 50 can rest on the neck portion 20b of the main body 20 via the shoulder 51b. Preferably, the shoulder 51b is in tight contact with the leakproof member 40d of the lid member 40, so as to prevent leakage and spillage of the first substance 30 contained in the main body 20

through the opening 20c. The outer axial hole 51d defined in the outer part 51 is in a round shape. The outer axial hole 51d is for allowing the mixture of the first and second substances 30, 80 to freely flow therethrough.

The first positioning portions 51e are disposed in both the inner surface and the bottom of the outer part 51, respectively. The first positioning portions 51e generally take the shape of spaced-apart depressions. It should be noted that the number and the structure of the first positioning portions 51e are exemplified herein for illustration purposes only, and are not intended to limit the present invention.

The inner part 53 comprises two second positioning portions 53a corresponding to the first positioning portions 51e and a round inner axial hole 53b defined therein. The inner axial hole 53b is in communication with the opening 20c and the storage chamber S. The second positioning portions 53a generally take the shape of spaced-apart protrusions formed in an outer surface of the inner part 53 for tight engagement with the first positioning portions 51e. Referring to FIG. 5, the inner part 53 is engagingly received in the outer part 51 such that gaps are formed between the inner and outer parts 53 and 51 for accommodating circumferential portions of the airtight member 60. Due to the engagement between the first positioning portions 51e and the second positioning portions 53a, the inner part 53 is non-rotatable relative to the outer part 51. An area of the circumferential portions of the airtight member 60 is sandwiched between the first positioning portion 51e and the second positioning portion 53a, and the remainders thereof are accommodated in the gaps. Consequently, the airtight member 60 is securely retained in the holder assembly 50.

The inner axial hole 53b of the inner part 53 is for allowing the mixture of the first and second substances to freely flow therethrough. The shape of the inner axial hole 53b is exemplified for illustration purposes only, and is not intended to limit the present invention.

The airtight member 60 comprises a containing portion 60a encapsulating the second substance 80. The containing portion 60a is preferably capable of separately containing at least one substance. The airtight member 60 is preferably made of materials selected from the group

consisting of aluminum foil, plastic film, and paper. Alternatively, the second substance 80 can be in a gaseous state, a liquid state, a solid state, or any combination thereof.

Referring to FIGS. 4-5, the opener 70 is coaxially slidably received in the inner part 53 of the holder assembly 50. The opener 70 comprises a pressing portion 70a at a top thereof, an active cutting portion 70b at a bottom thereof, an inactive dull portion 70c interposed between the active cutting portion 70b, and a through hole 70d. The through hole 70d is in communication with the opening 20c, the inner axial hole 53b, and the storage chamber S. The pressing portion 70a is shaped to be a semi-spherical protrusion. A distance between the pressing portion 70a and the top of the inner part 53 is greater than a distance between the active cutting portion 70b and the airtight member 60.

The active cutting portion 70b comprises a plurality of sharp tips for penetrating and cutting open the airtight member 60 to release and allow the second substance 80 to mix with the first substance 30. The structure of the active cutting portion 70b is exemplified herein for illustration only, and is not intended to limit the invention of this embodiment. Understandably, the inactive dull portion is for preventing the airtight member from being completely cut off.

Referring to FIGS. 5-6, when in use, a user simply needs to depress the pressing portion 70a of the opener 70 such that first portions of the airtight member 60 corresponding to the active cutting portion 70b of the opener 70 are cut open by the sharp tips. The second substance 80 then falls into and mixes with the first substance 30, wherein second portions of the airtight member 60 corresponding to the inactive dull portion 70c of the opener 70 remain intact, thereby allowing the second portion of the airtight member 60 to remain held by the holder assembly, thus completing the description of the first embodiment.

Referring to FIGS. 7-11, a container having separate storage chambers in accordance with a second embodiment of the present invention comprises a main body 20' for receiving a first substance, a lid member 40' tightly engaged with the main body 20', an airtight member 60' for encapsulation of a second substance 80', a holder assembly 50' for retaining the airtight member 60' in position, and an opener 70' for releasing the encapsulation of the second substance 80'.

Other parts are the same as or equivalent to similar parts in the container system according to the first embodiment of the invention. It should be noted that like parts in this and the first embodiment are identified by like reference numeral, and further description thereof is thus omitted below.

Most part of the structure of the container of the second embodiment is similar to the container of the first embodiment. The difference in the second embodiment is that the holder assembly 50c' further comprises a plurality of spaced first mating portions 51c' formed on the inner surface of the outer part 51'; with reference to FIGS. 7-10, the first mating portions 51c' are shown as, but not limited to, four hollow portions (FIG. 8) that are evenly arranged in the bottom of the outer part 51'. The inner part 53' of the holder assembly 50c' further comprises a plurality of second mating portions 53c' on the outer surface thereof, which are shown as downwardly tapered tabs extending from the bottom of the inner part 53' and can be engaged with the first mating portions 51c' of the outer part 51'. By the engagement between the first and second mating portions 51c', 53c', the second substance 80' received in the airtight member 60' can be held in the holder assembly 50c'. The number and shape of the first and second mating portions 51c', 53c' are flexibly adjusted as long as the engagement in-between can firmly secure the airtight member 60' in position not dropping into the storage chamber S' of the main body 20'.

Referring to FIG. 7, the opener 70' comprises a pressing portion 70a' that is substantially flush with a top of the holder assembly 50'. The pressing portion 70a' is generally a semi-spherical depression for facilitating depression. A distance between the pressing portion 70a' and a bottom of the lid member 40' is greater than a distance between the active cutting portion 70b' and the airtight member 60'. The main body 20' of the second embodiment is similar to the main body 20 of the first embodiment, except that the main body 20' does not include a neck portion. The leakproof member 40d' is generally a leak proof film disposed in an interior of the lid member 40'. The operation of the container of the second embodiment is similar to the container of the first embodiment, and the detailed description is thus omitted.

While the preferred embodiment in accordance with the present invention has been shown

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and described, equivalent modifications and changes known to persons skilled in the art according to the spirit of the present invention are considered to be within the scope of the present invention as defined in the appended claims.